

In the Drawings:

Please replace original sheets 2, 3 and 4 bearing Figs. 2, 3 and 4 with the enclosed Replacement Sheets. Reference character "O" has been added to Figs. 2, 3 and 4 to label the centerpoint or origin of each ellipse in conformance with the written description. The remaining Figs. 1, 5 and 6 are maintained unchanged.

**[RESPONSE CONTINUES ON NEXT PAGE]**

REMARKS:

- 1) The Examiner's attention is directed to the enclosed Letter to the Official Draftsperson and accompanying drawing Replacement Sheets bearing Figs. 2, 3 and 4. The reference character "O" has merely been added to these figures in conformance with the written description. No new matter has been introduced. Please approve the original formal drawings of Figs. 1, 5 and 6 as well as the present enclosed Replacement Sheets for Figs. 2, 3 and 4.
- 2) The Examiner's attention is directed to an Information Disclosure Statement being filed together with the present Response. Please consider the references and return an initialed, signed and dated acknowledgment copy of the IDS Form PTO-1449 together with the next official communication.
- 3) The original specification was essentially a literal translation of a corresponding foreign text. The specification has now been editorially amended to correct or clarify the idiomatic English grammar, sentence construction, and the like. The clarification at page 5, line 25 and similarly at page 7, line 14 and page 8, line 19 has original support in the disclosure at page 6, lines 16 and 17 as well as page 21, lines 3 and 4. Trademarks have been set forth in all capitals, and specific references to claim numbers have been avoided. These merely editorial corrections do not introduce any new matter. Entry and consideration of the amendments are respectfully requested.

- 4) All prior claims have been canceled. New claims 30 to 46 have been introduced. The new claims have been drafted "from the ground up" as a fresh approach at covering the inventive subject matter, with slightly different terminology, form and content in comparison to the original claims, which were essentially a literal translation of corresponding foreign claims. The new claims include three independent claims 30, 45 and 46. All of the new claims are supported in the original disclosure as shown in the following table, and do not introduce any new matter. Entry and consideration of the new claims are respectfully requested.

New Claims	30	31	32	33	34	35	36	37	38
Original Support	Cl. 1	Figs. 2, 3, 4, 6	Cl. 2	Cl. 3	Cl. 4	Cl. 5	Cl. 6	Cl. 7	Cl. 8

New Claims	39	40	41	42	43	44	45	46
Original Support	Cl. 9	Cl. 10	Cl. 11	Cl. 12	pg. 13, ln. 1-25	pg. 12, ln. 6	Cl. 1, 5, 12	Cl. 1; pg. 5, ln. 1- pg. 7, ln. 2

- 5) Referring to the second paragraph on page 6 of the Office Action, the rejection of claim 19 as indefinite under 35 USC §112, second paragraph for using the phrase "diamond-like carbon" is respectfully traversed. "Diamond-like carbon" is a term of art that is well understood by persons of ordinary skill in the relevant art. For example, it is respectfully submitted that a keyword search for "diamond-like carbon" in the USPTO database of US patents will turn up many, many hits for this term. Also, the term is defined in the present specification as referring to

a thin carbon film formed by a vapor phase synthesis method using a hydrocarbon or solid carbon as a raw material (see page 15, line 25 to page 16, line 2). For these reasons, the phrase "diamond-like carbon" does not render the claim indefinite because it is clearly and definitely understandable by a person of ordinary skill. Accordingly, please withdraw this rejection as inapplicable against any of the present new claims (e.g. claim 36).

- 6) Referring to the third and fourth paragraphs on page 6 of the Office Action, the trademark terms in the specification have been capitalized and are now set forth in a proper formal manner. Please withdraw any objection in this regard.
- 7) Referring to the several prior art rejections applying prior art references of Kim, Cox, Viollaz et al., Sasamoto et al., Gojny et al. and Tilley on pages 2 to 5 of the Office Action, these rejections have been obviated by the cancellation of all original claims. Moreover, these rejections cannot be applied against the new claims 30 to 46, for the following reasons, which will be discussed in connection with each of the new independent claims 30, 45 and 46.
- 8) New independent claim 30 is directed to a wood golf club head having recited first and second structural parameters adapted to achieve certain features of the flight of a golf ball struck by the club head.

Namely, the golf club head has a first structural parameter with a first value and a second structural parameter with a second value, which are respectively selected in combination with one another so that the club head is thereby adapted to strike and launch a golf ball with a particular launch angle and backspin speed as defined in the claim. The launch angle and the backspin speed shall fall within a region bounded by an ellipse defined in a coordinate system of backspin speed relative to launch angle.

As explained in the present specification, this invention has determined that there is a correlation or interaction of the launch angle and backspin speed of a golf ball struck by a golf club head and the resulting flight trajectory and thus the ball carry or travel distance of the golf ball, and further that there is a correlation between certain structural parameters (e.g. coefficient of friction and loft angle) of the club head and the resulting launch angle and backspin speed of the golf ball struck by the club head. In this regard see the specification, for example, at page 10, line 25 to page 11, line 25 and page 17, line 4 to page 18, line 3.

Thus, claim 30 now expressly defines that the golf club head has first and second structural parameters that are specifically selected in combination with one another so as to enable the golf club head to achieve the specified launch angle and backspin speed of the golf ball. Such structural features are neither disclosed nor would have been suggested by any or all of the applied prior art references.

To the contrary, the Examiner has not demonstrated that such features are disclosed or suggested by the references, but instead has merely asserted that no corresponding structure was defined in the original claims. Particularly, the Examiner asserted that each of the references includes the claimed structure which thus "*indicates that an ellipse as further claimed may also be designed*" (emphasis added) The Examiner's assertion in this regard is respectfully traversed as an improper basis for an anticipation or obviousness rejection. The fact that hypothetically something "may also be designed" in a certain manner does not substitute for an actual disclosure or a suggestion or motivation in the prior art for actually carrying out such a design. In fact, the prior art references would not have provided any such disclosures, teachings or motivations, because the prior art references do not suggest that there is any linkage or correlation between certain structural parameters of the golf club head and the resulting launch angle and backspin speed of the golf ball struck by the club head (and further with the ball carry or travel distance that can be achieved), as presently claimed.

New independent claim 30 expressly defines that the club head has first and second structural parameters that must be selected in combination with one another in a certain manner so as to achieve the defined launch angle and backspin speed of the golf ball. Since none of the prior art references disclose any structural parameters of a golf club head that are adapted to achieve such a launch angle and backspin speed in the angle-speed ellipse as defined in claim 30, the present invention is not

anticipated. Furthermore, for the above reasons, a person of ordinary skill in the art would have had no motivation for proceeding according to the invention, because the references would have provided no suggestion of any benefit or advantage to be achieved thereby. It is a novel and unobvious feature of the present invention to specifically select structural parameters of the club head to achieve the presently defined launch angle and backspin speed, which had not been achieved or even motivated in a purposeful manner in the prior art.

As further defined in dependent claims 42 to 44, the first and second structural parameters may especially and preferably be the loft angle and coefficient of friction of a striking face of the club head. Regarding claim 43, note that the loft angle has been defined as greater than 13°, which, in itself, is unusual and unique for golf club heads, and expressly distinguishes over the disclosure of Cox.

- 9) New independent claim 45 is directed to a wood golf club head having a striking face with a coefficient of friction and a loft angle selected in combination with one another so that the club head is adapted to launch the golf ball with a launch angle and a backspin speed within a particular defined elliptical region of angle-speed combinations.

Thus, in comparison to the above discussed claim 30, claim 45 additionally:

specifies the loft angle and the coefficient of friction of the striking face of the club head as the relevant structural parameters,

defines the ellipse by the coordinates of intersections of the ellipse with its major axis and its minor axis (as calculated from the origin, major axis length, minor axis length, and tilt angle of the ellipse as defined in original claim 1),

further limits the launch angle to be at least 19 degrees and the backspin speed to be not more than 3000 rpm, and

expressly limits the loft angle to be greater than 13°.

In view of the above discussion, it is apparent that the prior art references neither disclose nor would have suggested or motivated the combination of specific features and particularly the loft angle greater than 13° and the coefficient of friction selected so as to achieve the defined launch angle and backspin speed of the golf ball. For these reasons, the invention of claim 45 is neither anticipated nor would have been obvious over the references.

- 10) New independent claim 46 is directed to a method of designing a wood golf club head comprising particular steps that involve defining a particular combination or correlation of a launch angle and a backspin speed of a golf ball within a particular elliptical region of an angle-speed plot, testing golf club heads to determine a correlation of coefficients of friction and loft angles of golf club heads relative to the launch angle and backspin speed of golf balls launched by such golf club heads, selecting a combination of a coefficient of friction and a loft



angle for a striking face of a particular golf club so that the golf ball struck thereby will have the launch angle and backspin speed falling within the defined elliptical region, and then designing the particular golf club head to have the selected coefficient of friction and the selected loft angle. The prior art references have nothing to do with, make no relevant disclosures regarding, and would not have suggested anything with regard to such a sequence of steps for designing a golf club head. The prior art references would not even have suggested any correlation or pertinence of a specific combination of a coefficient of friction and loft angle of the club head with respect to the launch angle and backspin speed of the golf ball struck by such a golf club head, and finally the resulting ball carry or travel distance that can be achieved thereby. Thus, the presently claimed method is not anticipated and would not have been obvious over the prior art.

- 11) For the above reasons, the Examiner is respectfully requested to withdraw the prior art rejections based on Kim, Cox, Viollaz et al., Sasamoto et al., Gojny et al. and Tilley as inapplicable against any of the present new claims.
- 12) Referring to the bottom of page 6 of the Office Action, the additional prior art made of record requires no particular comments because it has not been applied in rejections against the claims. Nonetheless, in general it is noted that the "imaginary or real elliptical patterns on the face portion of a club head" asserted by the Examiner in several references are not

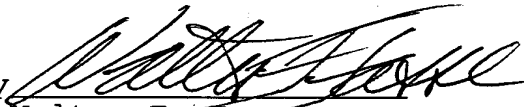
relevant to the present elliptical region, which is not physically defined on the face portion of the club head itself, but rather is defined as a grouping or range of ball launch angle relative to ball backspin speed in a graphical plot.

- 13) Favorable reconsideration and allowance of the application, including all present claims 30 to 46, are respectfully requested.

Respectfully submitted,  
Takeshi NARUO et al.  
Applicant

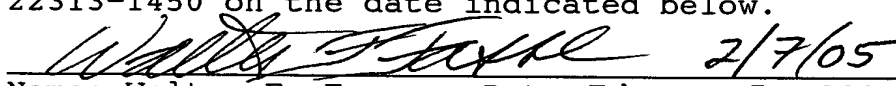
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IDS, Form PTO-1449,  
European Search Report,  
1 reference,  
Letter to Draftsman,  
3 Replacement Sheets of  
formal drawings with  
Figs. 2, 3, 4 thereon,  
Term Extension Request

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CERTIFICATE OF MAILING:

I hereby certify that this correspondence with all indicated enclosures is being deposited with the U. S. Postal Service with sufficient postage as first-class mail, in an envelope addressed to: COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 on the date indicated below.

 2/7/05  
Name: Walter F. Fasse - Date: February 7, 2005